Paper No. 11

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte TOSHIHIKO FUJII and HIDETO KATO

Appeal No. 2004-1999
Application No. 09/772,001

ON BRIEF

Before PAK, TIMM, and DELMENDO, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claims 1-20 which are all the claims pending in the application. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 134.

INTRODUCTION

The claims are directed to a surface treatment agent and a patterning process. Claims 19 and 20 are illustrative:

19. A surface treatment agent which, when applied to a substrate prior to formation of a resist pattern thereon, strengthens adhesion between the substrate and the resist pattern, the surface treatment agent comprising at least one compound of the following compositional formula:

$$R^1R^2_a(OX)_bSiO_{(3-a-b)/2} \qquad (1)$$

wherein R^1 is a $-(CH_{2)n}Y$ moiety in which Y is epoxycyclohexyl, glycidoxy, N-β-aminoethylamino, amino, N-phenylamino, mercapto or isocyanate, and n is an integer from 0 to 4; R^2 is a monovalent hydrocarbon group of 1 to 4 carbons; X is hydrogen or a monovalent hydrocarbon group of 1 to 4 carbons; "a" is 0 or 1, and "b" is 0, 1 or 2 when "a" is 0, and "b" is 0 or 1 when "a" is 1.

20. A patterning process comprising the steps of applying the surface treatment agent of claim 19 to a substrate and baking, then applying thereon a photoresist composition and patterning the photoresist.

As evidence of unpatentability, the Examiner relies upon the following prior art references:

Harris et al. (Harris)	5,668,210	Sep. 16, 1997
Lutz et al. (Lutz)	5,973,044	Oct. 26, 1999

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lutz in view of Harris.

We reverse for the following reasons. We also remand to the Examiner for consideration in light of further evidence.

OPINION

The examiner bears the initial burden of presenting a *prima facie* case of unpatentability. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). This burden must be satisfied by the examiner, otherwise, without more, applicants are entitled to a patent. *Id*. A most basic requirement of a *prima facie* case is the requirement that the evidence provide support for the factual findings made in the rejections. Such support is lacking here.

First, there is no support for the finding that Lutz teaches the hydrolysis of silanes to siloxanes (Finding in Answer at p. 4, ll. 18-21). Column 5, lines 31-51 of Lutz, the portion of Lutz cited in the rejection for support, does not describe hydrolysis, it describes an interchange reaction between alcohols and the silicon-bonded hydroxyl and/or hydrolyzable groups present on the organosiloxane (ingredient B) and the silane (ingredient C) (Lutz, col. 5, ll. 21-27). The reaction is conducted under an anhydrous atmosphere (Lutz, col. 5, ll. 28-40). In other words, there is no water present. The reaction is not a hydrolysis reaction. Hydrolysis is a reaction with water.[1]

Second, to say that Lutz at column 1, line 10 to column 2, line 20 teaches that it was well known in the art to use silane and siloxane containing polymeric compositions as adhesion promoters and primers is inaccurate (Finding in Answer at p. 4, ll. 8-9). There is a discussion in

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[1]See Hawley's Condensed Chemical Dictionary which states that hydrolysis is "[a] chemical reaction in which water reacts with another substance to form two or more new substances." Hydrolysis entry, Hawley's Condensed Chemical Dictionary, 14th ed. electronic ed. version 1.0.0.1 (2001). A copy of the electronic entry is attached to our Decision.

column 1, line 55 to column 2, line 22, of silane based adhesion promoters for organosiloxane compositions, but there is no mention here of primers. The Examiner offers no evidence indicating that one of ordinary skill in the art would have understood Lutz as discussing primers and from the bare words of Lutz, it appears that what is being discussed is not the use of silane compounds as primer coatings but the use of the silane compounds as additives in polymers to promote adhesion. An additive mixed into a polymer is not a primer as that word is ordinarily used. A primer, in the context used by Appellants, is a material used in priming a surface, i.e., a prime coat.[2]

We also note that the rejection does not adequately address the limitations of any particular claim. For instance, claims 1 and 19 require that the surface treatment agent contain a compound within a specific generic formula. The rejection does not adequately establish that it would have been obvious to one of ordinary skill in the art to formulate a surface treatment agent containing a compound within that formula. Nor does the rejection adequately establish that it would have been obvious to one of ordinary skill in the art to use such a treatment agent in the patterning process of claims 4 and 20. Where the relevant claims differ so widely in scope as do the product and process claims here under review, adequate treatment requires they be addressed separately. We note that Appellants had grouped the product and process claims separately.

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[2]See Merriam-Webster's Collegiate Dictionary, electronic ed. (2000) entry #2. A copy of the entry is attached to our Decision.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 1-20.

We further remand for the consideration of additional evidence which may be relevant to patentability. Pursuant to our remand, the Examiner should consider the following evidence.

First, the Examiner should consider the disclosure in Harris which establishes that it was known in the art to use hydrolyzed alkoxysilanes as adhesion promoters or coupling agents for various polymeric materials (Harris, col. 1, ll. 19-21). According to Harris, the hydrolyzed alkoxysilanes are typically used as primer layers between substrates and polymeric materials (Harris, col. 1, ll. 21-25). Therefore, Harris provides evidence that hydrolized alkoxysilane coupling agent were known for use as primers.

The Examiner should also consider Table 3 at 22 Kirk-Othmer Encyclopedia of Chemical Technology 150 (Jacqueline I. Kroschwitz & May Howe-Grant eds., 4th ed. 1997), a copy of which is included with our Decision. Kirk-Othmer lists 3-aminopropyltriethoxysilane, N–(2-aminoethyl)-3-aminopropyltrimethoxysilane, and 3-glycidoxypropyltrimethoxysilane as commercial silane coupling agents. *See* entry numbers 4-6, and 8 in Those coupling agents have the functional groups required by the claims and are within the alkoxysilane class of Harris.

The Examiner should also consider James R. Steinmetz, *Coupling Agents: Silanes*, Modern Plastics Encyclopedia 88 at pages 140 and 142, a copy of which is also included with our Decision. Steinmetz provides further evidence that use of hydrolyzed organosilane coupling

agents as primers on metal oxide as well as silicon oxide surfaces was known and that the organosilane is usually dissolved in alcohol.

The Examiner should consider the patentability of each of the claims in light of this evidence and any other relevant evidence and we remand to the Examiner for such consideration.

CONCLUSION

To summarize, the decision of the Examiner to reject claims 1-20 under 35 U.S.C. § 103(a) is reversed and the case remanded for further consideration of a rejection by the examiner. This remand to the examiner pursuant to 37 CFR § 41.50(a)(1)(effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)) is made for further consideration of a rejection. Accordingly, 37 CFR § 41.50(a)(2) applies if a supplemental examiner's answer is written in response to this remand by the Board.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

and

REMANDED

CHUNG K. PAK Administrative Patent Judge	)))))) BOARD OF PATENT
CATHERINE TIMM Administrative Patent Judge	) APPEALS) AND) INTERFERENCES
ROMULO H. DELMENDO Administrative Patent Judge	)))))

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